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The Superfluid Transition of Helium-4 in the Presence of an Applied Heat Flow in 1-g and below: Comparison between Experiment and Numerical Simulations MELORA LARSON, WILLIAM ELLSSON, *Jet Propulsion Laboratory, California Institute of Technology* We report on thermal conductivity measurements of liquid ^4He at the superfluid transition temperature at saturated vapor pressure. These measurements were made inside a superconducting magnet that could apply a $B \cdot \partial B/\partial z$ of up to $10 T^2/cm$ on the helium sample to vary the effective acceleration from 1-g to approximately 0.01 g. The thermal conductivity measurements consist of slowly ramping the temperature of the top of the cell through the transition from below while passing a constant heat current through the cell from the bottom. The temperature of the top of the cell, bottom of the cell, and the temperature at two positions along the length of the cell were monitored as the cell filled with normal fluid. We have also performed numerical simulations of the behavior on a 1-dimensional thermal conductivity cell similar to the experimental cell including appropriate Kapitza resistance effects. The distribution of local transition temperatures in the numerical simulations could be adjusted to account for an arbitrary gravitational environment. The numerical results and the observed experimental behavior will be quantitatively compared.

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[X] Prefer Oral Session
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Special instructions: suggested session: Quantum Fluids and Solids symposium

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